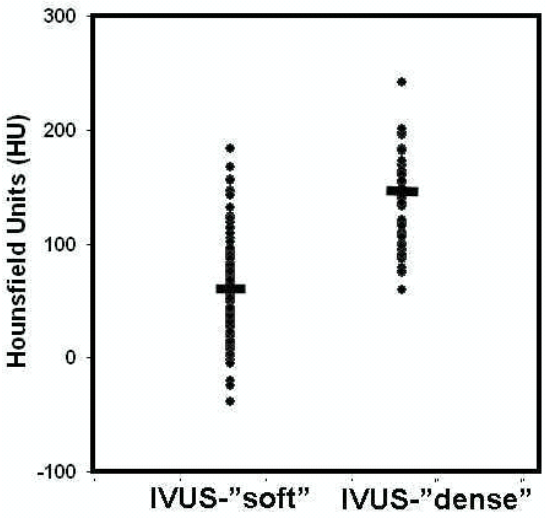
Methods: 20 patients (5 female, 15 male, mean age: 59 years) were studied. MDCT was performed using a 16 slice scanner with 0.75 mm collimation and 420 ms rotation time. 80 ml of contrast agent were injected i.v. and a half-scan reconstruction algorithm (210 ms temporal resolution) was applied. All patients received oral or i.v. beta blockers prior to the scan, the mean heart rate during MDCT was 59/min. IVUS of one coronary artery (40 MHz, motorized pull-back) was performed during coronary angiography one day after MDCT. In non-calcified coronary plaques identifyable in MDCT, the CT attenuation was measured and compared to the IVUS classification of the respective lesion, based on its echogenicity ("soft" = hypo-echogenic as compared to adventitia, "dense" = hyper-echogenic as compared to adventitia).
Results: MDCT and IVUS were compared at 237 sites. The mean CT density measured within plaques classified as "soft" by IVUS was 59+/-42HU (-39HU – 184HU) , while it was 137+/-44HU (60HU – 242 HU) in plaques classified as "dense" by IVUS ($p < 0.001$, see graph).
Conclusion: The average CT attenuation within non-calcified coronary atherosclerotic plaques varies with plaque type. However, there is significant overlap between plaques classified as "dense" and "soft" by IVUS.



1018-145 **The Reliability of Plaque Map Established by Multidetector Row Computed Tomography in Patients of Acute Coronary Syndrome**

Sei Komatsu, Yosuke Omori, Yuzuru Takano, Isamu Mizote, Atsushi Hirayama, Kazuhisa Kodama, Osaka Police Hospital, Osaka, Japan

Background: Coronary plaque disruption may cause acute coronary syndrome. Noninvasive detection of plaque characteristics of coronary artery may have important role of risk stratification. To evaluate the characteristics of the plaque, we established plaque characteristics ("Plaque map") by Multi-Detector Row Computed Tomography and compared with the findings of intravascular ultrasonography (IVUS) and angioscopy.
Methods: Forty-five patients (78 vessels) were entried; 24 were acute myocardial infarction (after recanalization therapy) and 21 were unstable angina. The cross section (except for stent) obtained by Eight-detector MDCT (Light Speed Ultra (GE, USA)) was made in 0.4 mm thickness, at intervals of 5 mm of the coronary artery. The vessel characteristics (minimum plaque density, maximum plaque density, lumen area, average vessel diameter and so on) were measured and compared with IVUS and yellow plaques in angioscopy.
Results: The number of Low density plaques (defined as <50 HU), intermediate plaques (50 to 150 HU), and calcified plaques (>400 HU) detected by MDCT was 113, 135, and 56, respectively. Comparing IVUS, the sensitivity of low density plaque, intermediate plaque, and calcified plaque were 91, 86, and 92 %, respectively.
The specificity of low density plaque, intermediate plaque, and calcified plaque was 86, 81, 88 %, respectively. Low density plaque by MDCT was correlated with yellow plaque detected by angioscopy ($p<0.05$). Lumen area calculated by MDCT was correlated with that by IVUS ($p<0.05$).
Conclusions: Our result indicated that "plaque map" obtained by MDCT might play a role for risk stratification of ACS. .

1018-146 **Detection of Plaque Instability Predictors by Multislice Computed Tomography: Comparison With Intravascular Ultrasound**

Patricia M. Carrascosa, Sr., Carlos Capuñay, Sr., Peter Johnson, Sr., Pablo Garcia Merletti, Sr., Raul Pissinis, Sr., Jorge Manuel Carrascosa, Sr., Diagnostico Maipu, Buenos Aires, Argentina

Background: determine correlation between Multislice CT (MSCT) and IVUS in the quantification of coronary stenosis and characterization of plaques.
Methods: forty patients with known coronary artery disease (CAD) were evaluated with MSCT and IVUS. CTs were performed in a 4-row CT scanner with 4x1 mm collimation, 0.5mm slice increment, 0.375 pitch, 120 kVp and 360-400 mAs and 130 ml of non-ionic iodinated contrast material. During the acquisition, the patients' ECG were recorded. Images were sent to an off-line reconstruction to obtain gated images with no motion artifacts.
IVUS were carried out with an Ultra Cross 3.2F, 30-MhZ coronary imaging catheter.
Cross-sectional images from both methods were matched via distance (10mm) from the ostium up to the vessel reach the diameter of 2mm. The analysis was done by two independent readers. The presence and type of plaques were assessed by CT and IVUS and findings were compared.
IVUS classified the plaques in, soft plaques (SP), fibrous plaques (FCP), calcified plaques (CP).
From the MSCT images, small regions of interest were placed in the region of the plaques and the mean and standard deviation of each type of plaque in Hounsfield Units (HU) were calculated for ROI.
The percentage of stenosis quantified by area was performed by the two methods. It was considered a positive finding if the stenosis was >/= 50%.
Statistical Analysis: variability among methods was performed by Spearman rank order correlation by two observers.
Results: a total of 273 plaques were detected by both methods. There were 185 (68.23%) SP, 45 (16.24%) FCP and 43 (15.52%) CP. The mean and standard deviation of the SP, FC and CP were 71.55 HU (+/- 32.05), 116.25 HU (+/- 35.71) and 383.33 HU (+/- 186.06) respectively as measured by MSCT.
There was good correlation between MSCT and IVUS. Observer 1 showed rS= 0.83 (0.78, 0.87), $p<0.0001$ and observer 2 showed rS= 0.89 (0.83, 0.92), $p< 0.0001$.
Conclusion: MSCT is a useful tool in the evaluation of patients with CAD. This technology has the potential to evaluate the arterial lumen and walls and differentiate the types of plaques based on density. MSCT showed good correlation in the quantification of coronary artery stenosis.

1018-147 **Comparison of Retrospectively Electrocardiogram-Gated, Multislice Spiral Computed Tomography and Selective Coronary Angiography in the Analysis of Stent Permeability After Left Main or Ostial Coronary Artery Angioplasty**

E. Maupas, D. Carrié, M. Elbaz, M. Bennaceur, H. Rousseau, F. Joffre, J. Puel, Rangueil Hospital, Toulouse, France

Background - Multislice spiral CT with retrospective ECG gating is a new approach for noninvasive coronary artery imaging. We investigated the method's ability to evaluate stent permeability after coronary percutaneous angioplasty with stent implantation (left main or ostial coronary artery).
Methods and Results - We prospectively studied seventy consecutive patients in sinus rythm who had undergone left main (84 %) or ostial (16 %) coronary artery percutaneous transluminal angioplasty with stent implantation. ECG-gated MSCT angiography was performed with a 16-slice MSCT scanner (Sensation 16, Siemens; 0.42-s rotation time, 12 x 0.75-mm slice thickness) 24 hours after angioplasty. The left main or ostial coronary stents were assessed by MSCT with regards to their permeability (detection of significant stenosis (> 50 %) or occlusion).The analysis was independently performed by double blinded observers, with the use of a computer-assisted system. Results were compared with quantitative coronary angiography, which currently represents the reference standard.
62 of the 70 patients (88 %) had received beta-blocker treatment (average heart rate: 72 +/- 5 min^{-1}). After intravenous injection of a non ionic contrast medium with high iodine content, the entire heart was scanned within a single breath-hold.
The MSCT investigation was completed successfully and without any complications in all patients. The absence of significant stent stenosis (> 50 %) or occlusion was correctly identified in 67 out of 70 patients (compared with selective coronary angiography, the sensitivity for the analysis of stent permeability was 95%). In 2 patients, the stent's permeability could not be evaluated because of severe calcifications in the vessel wall of small coronary arteries (diameter < 2.5 mm).
All patients will be controlled by quantitative coronary angiography and MSCT scanner after a six month follow-up.
Conclusion - These preliminary results suggest that the new generation MSCT scanner is an effective noninvasive technology for the visualisation of proximal coronary stents after angioplasty and may also become the choice procedure to detect restenosis.

1018-148 **Assessment of Coronary Artery Stent Patency With In-Stent Contrast Enhancement in Multirow Detector Computed Tomography Angiography**

George S. Chrysant, Cheng Hong, Pamela K. Woodard, John M. Lasala, Kyongtae T. Bae, Washington University School of Medicine, St Louis, MO

Background
Multi-detector Row Computed Tomography (MDCT) offers a noninvasive imaging method for determining coronary stent patency. The purpose of this study was to investigate the accuracy and contrast enhancement characteristics of 16-row detector MDCT in assessing the patency of implanted coronary stents.
Methods
19 patients with 26 total stents underwent 16-row MDCT within 3 weeks of stent implantation. Scanning was performed with 12 X 0.75mm collimation, 0.42 sec rotation time, and ECG-gated spiral mode. Two sets of images in 1mm slice thickness were generated (1 with conventional resolution, 1 with a high-resolution reconstruction kernel). CT attenuation on the stent strut and in the coronary lumen proximal, distal and inside the stent was measured. The stent inner diameter measured by CT was compared to angiographic images.
Results